

CLAIMS

What is claimed is:

1. A heating, ventilation, and air conditioning (HVAC) system comprising:
 - (A) a housing defining an air inlet and an air outlet for directing air flow between 5 said inlet and said outlet;
 - (B) a film disposed in said housing and moveable between open and closed positions for controlling the air flow through said housing, said film comprising:
 - (1) a substrate comprising a fiber selected from the group of polyester-based fibers, glass-based fibers, and combinations thereof;
 - (2) an elastomeric layer disposed on said substrate; and
 - (3) a silicone topcoat layer disposed on said elastomeric layer for minimizing noise created as said film moves between said open and closed positions.
2. A HVAC system as set forth in claim 1 wherein said silicone topcoat layer is formed from a silicone-containing composition comprising a vinyl and methoxy functional 15 dimethyl siloxane.
3. A HVAC system as set forth in claim 1 wherein said silicone topcoat layer has a thickness of from 0.2 and 0.7 mils.
4. A HVAC system as set forth in claim 1 wherein said elastomeric layer comprises a silicone rubber.
- 20 5. A HVAC system as set forth in claim 4 wherein said silicone topcoat layer is formed from a silicone-containing composition comprising a vinyl and methoxy functional dimethyl siloxane.
6. A HVAC system as set forth in claim 4 wherein said silicone rubber comprises an organic peroxide catalyst.

7. A HVAC system as set forth in claim 1 wherein said elastomeric layer comprises a urethane.

8. A HVAC system as set forth in claim 1 wherein said film further comprises a fluoropolymer layer disposed between said substrate and said elastomer layer.

5 9. A HVAC system as set forth in claim 8 wherein said fluoropolymer layer comprises a perfluoropolymer.

10. A HVAC system as set forth in claim 9 wherein said perfluoropolymer comprises polytetrafluoroethylene.

11. A HVAC system as set forth in claim 8 wherein said fluoropolymer layer is 10 disposed on opposite faces of said substrate.

12. A HVAC system as set forth in claim 8 wherein said film further comprises a binder layer disposed between said fluoropolymer layer and said elastomeric layer for rendering said elastomeric layer bondable to said fluoropolymer layer.

13. A HVAC system as set forth in claim 12 wherein said binder layer comprises a 15 mixture of silica and a perfluorinated copolymer resin.

14. A HVAC system as set forth in claim 12 wherein said binder layer has a thickness of 0.03 to 0.20 mils.

15. A HVAC system as set forth in claim 1 further comprising openings defined within said film for aligning with said outlet of said housing.

20 16. A HVAC system as set forth in claim 1 wherein said fiber comprises woven, glass-based fibers.

17. A HVAC system as set forth in claim 1 wherein said fiber comprises non-woven, glass-based fibers.

18. A HVAC system as set forth in claim 1 wherein said fiber comprises at least 25 one of woven, polyester-based fibers and non-woven, polyester-based fibers.

19. A HVAC system as set forth in claim 1 wherein said film is housed within a film valve assembly.

20. A HVAC system as set forth in claim 19 wherein said film valve assembly comprises a frame defining at least one aperture.

5 21. A HVAC system as set forth in claim 20 wherein said film valve assembly further comprises first and second rollers supported for rotation by said frame and disposed at opposite ends of said frame.

10 22. A HVAC system as set forth in claim 21 wherein said film valve assembly further comprises an idle roller supported for rotation by said frame and disposed between said first and second rollers.

23. A HVAC system as set forth in claim 21 wherein said film is wound and unwound relative to said first and second rollers and suspended across said aperture.

15 24. A HVAC system as set forth in claim 8 further comprising an additive disposed in said fluoropolymer layer for making said fluoropolymer layer non-electrically charging.

25. A HVAC system as set forth in claim 24 wherein said additive is selected from the group of carbon black, graphite, metallic powder, metallic flakes, metallic fibers, and combinations thereof.

26. A film valve assembly for a heating, ventilation, and air conditioning system, said assembly comprising:

- (A) a frame;
- (B) first and second rollers supported for rotation by said frame and disposed at 5 opposite ends of said frame;
- (C) an idle roller supported for rotation by said frame and disposed between said first and second rollers; and
- (D) a film wound and unwound relative to said first and second rollers, said film comprising;

10 (1) a substrate comprising a fiber selected from the group of polyester-based fibers, glass-based fibers, and combinations thereof;

15 (2) an elastomeric layer disposed on said substrate; and

(3) a silicone topcoat layer disposed on said elastomeric layer for minimizing noise created as said film is wound and unwound relative to said first and second rollers.

27. A film valve assembly as set forth in claim 26 wherein said silicone topcoat layer is formed from a silicone-containing composition comprising a vinyl and methoxy functional dimethyl siloxane.

28. A film valve assembly as set forth in claim 26 wherein said elastomeric layer 20 comprises a silicone rubber.

29. A film valve assembly as set forth in claim 26 wherein said elastomeric layer comprises a urethane.

30. A film valve assembly as set forth in claim 26 wherein said film further comprises a fluoropolymer layer disposed between said substrate and said elastomer layer.

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31. A film valve assembly as set forth in claim 26 wherein said fiber comprises woven, glass-based fibers.

32. A film valve assembly as set forth in claim 26 wherein said fiber comprises non-woven, glass-based fibers.

5 33. A film valve assembly as set forth in claim 26 wherein said fiber comprises at least one of woven, polyester-based fibers and non-woven, polyester-based fibers.